

REMARKS

The Applicants had an Examiner's telephone interview on October 06, 2003 to discuss the Office Action of August 04, 2003. The Applicants pointed out that there were informalities in Claims 1 and 5 which needed to be corrected. In Claim 1, the term "translation" was omitted before actuator in line 9. The Applicants further pointed out that in Claim 5, line 1, the phrase "said linear actuator" should have been "wherein said translation actuator." With these corrections, the Examiner stated that the invention more clearly stated the differences between the cited prior art. The Applicants further pointed out that the prior art *Schneider* uses two motors wherein one motor has a threaded shaft coupled to the rotor and the other motor has a spring. In the present invention, one motor is coupled to a spring, a translation actuator, and a threaded shaft to form a linear actuator. *Schneider* only teaches moving a first motor with an attached scanning head with a second motor which is coupled to a threaded shaft. *Schneider* has no rotational or translational stops for setting the stroke of the linear actuator. The present invention uses a single DC motor coupled to a torsion spring, a threaded shaft coupled to the rotor of the motor and a translation actuator, and rotational and translational stops to form a replacement for a solenoid type device where energizing the motor causes the translational actuator to move a fixed distance, contact a load and return to its home position.

Claims 1, 5, 6, 7, 8, and 10 have been amended to correct informalities.

Claims 1-15 are pending in the Application.

The Applicants respectfully assert that the amendments to Claims 1, 5, 6, 7, 8, and 10 and incorporated by reference in any claims depending therefrom, are not narrowing amendments made for a reason related to the statutory requirements for a patent that will give rise to prosecution history estoppel. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 56 U.S.P.Q. 1865, 1870 (Fed. Cir. 2000).

I. REJECTION UNDER 35 U.S.C. § 103(a)

In the previous Office Action having a mailing date of December 4, 2002, the Examiner rejected Claims 1-12 and 15 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,935,071 to *Schneider et al.* (hereafter "*Schneider*"). The Applicants have noted that the Examiner has by his own omission of such rejection now concluded that *Schneider* does not anticipate the present invention. The Examiner is now asserting the rejection of the present invention under 35 U.S.C. § 103(a) over *Schneider* in view of U.S. Patent No. 5,735,243 to *Asai et al.* (hereafter "*Asai*").

The CFR 37 § 1.104 section C (2) states the following: In rejecting Claims for want of a novelty or for obviousness, the Examiner must cite the best references at his/her command. When a reference is complex or shows or describes inventions other than that claimed by the Applicants, the particular part relied on which the Examiner relies must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained in each rejected claim specified.

Claims 1-12 and Claim 15 have been rejected under 35 U.S.C. § 103(a) as being anticipated by *Schneider* in view of *Asai*. The Examiner states that the Applicants arguments have been considered but are moot in view of new grounds of rejection. The Examiner then rejects Claims 1-3 as being obvious over *Schneider*.

Amended Claim 1 recites a linear actuator comprising a direct current (DC) motor having a stator and a rotor, the stator fixed to a reference frame, a threaded shaft coupled to the rotor, a torsion spring disposed perpendicular to the axis of said threaded shaft, said torsion spring comprising a center portion coaxially attached to the threaded shaft and an outer portion attached to the reference frame, and a translation actuator threadedly coupled to the threaded shaft, the translation actuator rotationally stopped and operable to laterally translate in response to rotation of the threaded shaft by the DC motor.

The Examiner then states that *Schneider* clearly teaches the following: "the construction of an ultrasonic biometrics imaging and identity verification system comprising;

(element of Claim 1) a direct current (DC) motor (92) having a stator and a rotor, said stator fixed to a reference frame;

(element of Claim 1) a threaded shaft (170) coupled to said rotor;

(element of Claim 1) a torsion spring (330, 332) disposed perpendicular to said axis of said threaded shaft, said torsion spring comprising a center portion coaxially attached to said threaded shaft and an outer portion attached to said reference frame,

(element of Claim 2) (sic) storing rotational energy from DC motor when said DC motor rotates said threaded shaft in a first rotary direction, said torsion spring returning rotational energy to said shaft a second rotary direction when said DC motor is un-energized; and

(element of Claim 1) a translation actuator (112) threadedly coupled to said threaded shaft, the actuator rotationally stopped and operable to laterally translate in response to rotation of said threaded shaft by said DC motor and

(element of Claim 3) (sic) having portion operable to engage a mechanical load."

The Examiner states that *Schneider* teaches the first element of Claim 1 which is a DC motor having a stator and rotor, wherein the stator is fixed to a reference frame and cites that *Schneider* teaches a "direct current (DC) motor (92) having a stator and a rotor, said rotor fixed to a reference frame." Motor 92 is shown in FIG. 1 of *Schneider*. The Examiner then states that *Schneider* teaches "a threaded shaft (170) coupled to the rotor and coaxially coupled to a rotational shaft stop, the shaft stop having a first and second shaft stop surface." The Examiner states that the threaded shaft 170 is likewise shown in FIG. 1 and coupled to motor 92. However, FIG. 1 of *Schneider* does not teach that the threaded shaft is "coaxially coupled to a rotational shaft stop, said shaft stop

having a first and second shaft stop surface" as stated in Claim 1 of the present invention.

In FIG. 1 of *Schneider*, threaded shaft 170 is coupled to another motor 90. *Schneider*, column 6, lines 56-66. In *Schneider*, Motor 92 acts as a linear actuator and has threaded shaft 170. Shaft 170 is coupled to motor 90 and is not coupled to a rotational shaft stop with first and second shaft stop surfaces as stated clearly in Claim 1 of the present invention. Nowhere in *Schneider* does motor 92 with threaded shaft 170 couple to a rotational shaft stop.

The third element of Claim 1 is a torsion spring disposed perpendicular to the axis of the thread shaft and has a center portion coupled to the threaded shaft and an outer portion coupled to the reference frame. The Examiner states that *Schneider* teaches the torsion spring of Claim 1 and cites torsion springs 330 and 332, which are found in FIG. 13. In FIG. 13, *Schneider* is describing a spring that is coupled to motor 90. First, neither torsion spring 330 or 332 is coupled to the threaded shaft as recited in Claim 1. Secondly, neither torsion spring 330 or 332 has an outer portion coupled to the reference frame to which motor 92 is attached. While a motor and a torsion spring are found in *Schneider*, they are not coupled and they do not form the same structure as recited in Claim 1 of the present invention. In *Schneider*, Motor 90 and its corresponding torsion springs 330 and 332 form an oscillatory motor that move transducer 16 back and forth in a plane substantially tangential to threaded shaft 170. Linear motor 92 moves the oscillatory motor comprising motor 90. *Schneider*, column 9, lines 51-54. Motor 90 is coupled to torsion springs 330 and 332 and does not form a linear actuator as is recited in Claim 1. Likewise, motor 92 and threaded shaft 170 form a linear motor but do not comprise torsion springs or a rotational shaft stop coupled to the threaded shaft as recited in Claim 1.

The fourth element of Claim 1 is a translation actuator threadedly coupled to the threaded shaft, wherein the translation actuator is rotationally stopped and translates laterally in response to rotation of the threaded shaft. In *Schneider*, the oscillatory motor formed by motor 90 and torsion springs 330 and 332 is moved by a second motor, linear motor 92. The oscillatory motor formed by motor 90 and torsion springs 330 and 332

are coupled to transducer 16 and are not a "translation actuator" as recited by Claim 1. The oscillatory motor does not actuate anything and is in fact immersed in a fluid 30. Fluid 30 is formulated to transmit ultrasonic energy of transducer 16 coupled to the oscillatory motor. *Schneider*, column 5, lines 30-59. The Applicants assert that *Schneider* does not teach or suggest all of the elements of Claim 1. Therefore, the Applicants respectfully assert that the rejection of Claim 1 under 35 U.S.C. § 103(a) over *Schneider* in view of *Asai* is traversed for the reasons stated above.

Claim 2 is dependent from Claim 1 and contains all the limitations of Claim 1. The Applicants have shown that Claim 1 is not obvious over *Schneider* and *Asai*. Claim 2 adds the limitation that the torsion spring of Claim 1 stores rotational energy from DC motor when said DC motor rotates said threaded shaft in a first rotary direction, said torsion spring returning rotational energy to said shaft in a second rotary direction when said DC motor is un-energized. While *Schneider* does teach "crossed springs (330, 332) which may act as a torsion spring", it is not the torsion spring configured as recited in Claim 1 where the torsion spring has a center portion coaxially coupled to the threaded shaft. The threaded shaft 170 of *Schneider* is not coupled to crossed springs 330, 332 and there is no teaching or suggestion in *Schneider* to couple crossed springs 330, 332 with threaded shaft 170 to arrive at the invention of Claim 2. Therefore, the Applicants respectfully assert that the rejection of Claim 2 under 35 U.S.C. § 103(a) over *Schneider* in view of *Asai* is traversed for the reasons stated above.

Claim 3 is dependent from Claim 1 and contains all the limitations of Claim 1. The Applicants have shown that Claim 1 is not obvious over *Schneider*. Claim 3 adds the limitation that the translation actuator has a portion operable to engage a mechanical load. *Schneider* is teaching the construction of an ultrasonic biometric imaging and identity verification system and is not a linear actuator of Claim 1. Since *Schneider* has no translation actuator and does not contact a mechanical load, there is no teaching or suggestion of Claim 3 in the disclosure of *Schneider*. Therefore, the Applicants respectfully assert that the rejection of Claim 3 under 35 U.S.C. § 103(a) over *Schneider*

in view of *Asai* is traversed for the reasons stated above and for the same reasons as Claim 1.

The Examiner states that *Schneider* fails to disclose (sic) (Claim 4) "a shaft coaxially coupled to a rotational shaft stop, the shaft stop having first and second shaft stop surfaces, and (Claim 5) a second actuator stop, the first actuator contacting the first shaft stop surface in a first rotation position and the second actuator stop contacting the second shaft stop surface in a second rotation position, wherein a first and second force resulting from the first and second actuator stops contacting the first and second shaft stop surfaces, respectively, act tangentially to a radius vector of the threaded shaft." The Examiner then states that *Asai* teaches the construction of a controller having a shaft coaxially coupled to a rotational shaft stop, the shaft stop having a first and second shaft stop surfaces (9,12), and a first and a second actuator stop (6a, 7a) the first actuator stop contacting the first shaft stop surface in a first rotation position and the second actuator stop contacting the second shaft stop surface at a second rotation position, wherein a first and second force resulting from the first and second actuator stops contacting the first and second shaft stop surfaces, respectively, act tangential to a radius vector of the threaded shaft for the purpose of preventing a throttle valve from locking at fully closed position. The Examiner states it would have been obvious to one skilled in the art at the time of the invention was made to use the controller disclosed in *Asai* on the ultrasonic biometric imaging and identity verification system disclosed in *Schneider* for the purpose of preventing the valve or translation actuator from locking in any position.

Claim 4 is dependent from Claim 1 and contains all the limitations of Claim 1. The Applicants have shown that Claim 1 is not obvious over *Schneider*. Claim 4 adds the limitation that the threaded shaft is coaxially coupled to a rotational shaft stop, said shaft stop having a first and second shaft stop surface. *Schneider* does not teach or suggest a translation actuator. *Asai* teaches a controller for a throttle valve that has a rotary stop to define how far to open the throttle valve and a return spring that prevents the throttle valve from sticking in the closed position. *Asai* also does not teach or suggest a translation actuator. The threaded shaft of Claim 1 is threadedly coupled to a

translation actuator and Claim 4 further limits the threaded shaft of Claim 1 wherein the threaded shaft is coaxially coupled to a rotational shaft stop, said shaft stop having a first and second shaft stop surface. There is no teaching or suggestion to combine the teachings of *Schneider* with *Asai* to arrive at the invention of Claim 4. Therefore, the Applicants respectfully assert that the rejection of Claim 4 under 35 U.S.C. § 103(a) over *Schneider* in view of *Asai* is traversed for the reasons stated above and for the same reasons as Claim 1.

Claim 5 has been amended to correct an informality where linear actuator following claim 4 should have read "wherein said translation actuator." Claim 5 is dependent from Claim 4 and contains all the limitations of Claim 4. Claim 5 adds the limitation that the translation actuator comprises a first and a second actuator stop. The Applicants have shown that Claim 4 is not obvious over *Schneider* in view of *Asai*. Claim 5 adds a limitation to a translation actuator that is neither taught nor suggested in *Schneider* or *Asai*, singly or in combination. Therefore, the Applicants respectfully assert that the rejection of Claim 5 under 35 U.S.C. § 103(a) over *Schneider* in view of *Asai* is traversed for the reasons stated above and for the same reasons as Claim 4.

The Examiner states that "with regards to Claims 6 and 11, *Schneider* in view of *Asai* discloses an ultrasonic biometric imaging and identity verification system and controller where an application of a drive voltage pulse to the DC motor drives the linear actuator in a first direction until the second actuator stop contacts the second shaft stop surface and removing the drive voltage pulse releases the stored rotational energy in the torsion spring, the stored rotational energy drive the linear actuator in a second direction until the first actuator stop contacts the first shaft stop surface.

Schneider teaches an ultrasonic system where one motor moves an imaging head over a surface while the other motor moves the head back and forth. *Asai* discloses a throttle controller where the throttle is driven by motor (2) under control of computer (17). Motor (2) continuously varies the throttle under control of data generated by computer (17). There is no teaching or suggestion in *Asai* that the throttle controller

utilizes only two states of the motor, therefore *Asai* does not teach or suggest the limitation of Claim 6. Likewise, *Schneider* does not teach or suggest driving the motor coupled to the threaded shaft in a first direction until the second actuator stop contacts a shaft stop and removing the drive pulse releasing stored rotational energy in the torsion spring to drive the linear actuator in a second direction until the first actuator stop contacts the first shaft stop surface. While disjointed elements of the present elements appear in *Schneider* and *Asai* the combination of elements is described in Claim 6 of the present invention are not taught or suggested in *Schneider* or *Asai*, singly or in combination. Therefore, the Applicants respectfully assert that the rejection of Claim 6 under 35 U.S.C. § 103(a) over *Schneider* in view of *Asai* is traversed for the reasons stated above and for the same reasons as Claims 1 and 5.

The Examiner rejected Claim 11 for the same reasons as Claim 6. Claim 11 depends from Claim 10 which is dependent from Claim 9 which is dependent from independent Claim 7. While the Examiner makes a blanket rejection of Claims 1-12, the Examiner fails to specifically point out where he believes Claims 7, 8, 9, and 10 are disclosed by *Schneider* and *Asai*, either singly or in combination. The Applicants respectfully assert that the Examiner fails to make the *prima facie* case of obviousness as required in 37 § 1.104 section C(2). Therefore, the Applicants assert that the rejection of Claim 11 under 35 U.S.C. § 103(a) over *Schneider* in view of *Asai* is traversed for the reasons stated above and for the same reasons as Claim 6. Also, the Applicants assert that the Examiner fails to make the *prima facie* case of obviousness of Claims 8, 9, and 10 as required in 37 § 1.104 section C(2). Therefore, the Applicants assert that the rejections of Claims 8, 9, and 10 under 35 U.S.C. § 103(a) over *Schneider* in view of *Asai* are traversed for the reasons stated above and for the same reasons as Claim 6.

The Examiner rejected Claims 13-14 under 35 U.S.C. § 103(a) as being unpatentable over *Schneider* in view of *Asai* and further in view of U.S. Patent No. 5, 777, 404 to *Has*.

Claim 13 is a dependent claim to independent Claim 7. The Examiner failed to address independent Claim 7 and thus cannot separately address dependent Claim 13, which contains all the limitations of the independent Claim 7. Claim 7 recites a linear translating actuator comprising an energy storing means for storing rotational energy from the DC motor. Claim 13 limits the energy storing means to an elastic strip fixed to the shaft and to the frame, wherein the elastic strip wraps on the shaft and stretches to store energy. The Examiner states that *Schneider* does not teach the elastic strip or a linear spring recited in Claim 13. The Applicants respectfully assert that nowhere in Claim 13 is a linear spring recited and is confused to why the Examiner makes this admission about *Schneider* concerning a linear spring which is not recited in Claim 13 of the present invention. The Examiner then states that *Has* does teach "the construction of a rotating actuator having an elastic strip (10) and a linear spring (1) for the purpose of setting the flywheel (2) and actuating element (3) into movement through a defined free angle (20). The element that the Examiner identifies as "elastic strip 10" in *Has* is actually a locking device 10. *Has*, column 9, lines 35-37. The present invention recites a linear translating actuator comprising a DC motor. *Has* is teaching away from a DC motor and states that an object of the invention is an actuator that operates without external energy sources which are required for a DC motor as recited in Claim 7. *Has* column 1, lines 24-34. Nowhere does *Has* or *Schneider* teach or suggest the use of an elastic strip as recited in Claim 13.

The Applicants respectfully assert that the Examiner fails to make the *prima facie* case of obviousness as required in 37 § 1.104 section C(2). Therefore, the Applicants assert that the rejection of Claim 13 under 35 U.S.C. § 103(a) as being obvious over *Schneider* in view of *Asai* and further in view of *Has* is traversed.

Claim 14 is a dependent claim to independent Claim 7. The Examiner failed to address independent Claim 7 and thus cannot separately address dependent Claim 14, which contains all the limitations of the independent Claim 7. Therefore, the Applicants respectfully assert that the Examiner fails to make the *prima facie* case of obviousness as required in 37 § 1.104 section C(2). Therefore, the Applicants assert that the rejection

of Claim 13 under 35 U.S.C. § 103(a) as being obvious over *Schneider* in view of *Asai* and further in view of *Has* is traversed.

The Examiner fails to address Claim 15, which is a dependent claim to Claim 7 further limiting the conversion means to a threaded screw member. Therefore, the Applicants respectfully assert that the Examiner fails to make the *prima facie* case of obviousness as required in 37 § 1.104 section C(2). Therefore, the Applicants assert that the rejection of Claim 15 under 35 U.S.C. § 103(a) as being obvious over *Schneider* in view of *Asai* and further in view of *Has* is traversed.

III. CONCLUSION

The Applicants have amended Claims 1, 5-8, and 10-11 to correct informalities as suggested by the Examiner so that these claims more clearly point how the differences between the claims of the present invention and the prior art.

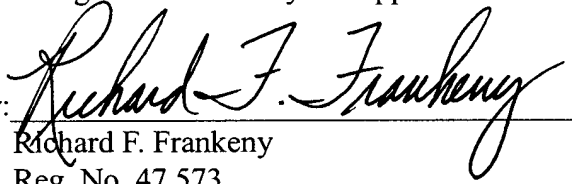
The Applicants have traversed the rejections to Amended Claim 1, Claims 2-4, amended Claims 5-8, Claim 9, amended Claims 10-11 and Claims 12-15 under 35 U.S.C. § 103(a) as being obvious over *Schneider* in view of *Asai* and further in view of *Has*. Therefore, the Applicants assert that amended Claims 1, 5-8, and 10-11 and Claims 2-4, 9, and 12-15 are now in condition for allowance and request an early allowance of these claims.

Applicants respectfully request that the Examiner call Applicants' attorney at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

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